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ABSTRACT

A paper dealing with the comprehension of metaphor and a second paper addressing the ramifications of the first paper's ideas for teaching practices are contained in this report. The opening section of the first paper explains why language theorists and scholars in a number of disciplines are interested in metaphor. Its next section deals with metaphor and meaning, explaining the three predominant views of metaphor: the substitution view, the comparison view, and the interaction view. The paper's third secton establishes a framework for understanding comprehension in general as prelude to the survey of empirical research that comprises the paper's next section. The paper's conclusion summarizes the main points of the article and outlines future research in the area of metaphor. The second paper in the report relates the understanding of metaphor expressed in the first paper to current and future teaching practices. It concludes that starting with literature children already know and reading to them is the best way to help them develop the skills they need to comprehend metaphor. (JL)

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CENTER FOR THE STUDY OF READING

Reading Education Report No. 38

THEORETICAL AND METHODOLOGICAL ISSUES IN THE EMPIRICAL STUDY OF METAPHOR

Andrew Ortony

IMPLICATIONS AND SUGGESTIONS FOR TEACHERS

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March 1983

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Foreword

The Reading Education Report Series is intended to be a forum in which the latest theoretical notions, research findings and classroom considerations related to reading comprehension are addressed. The present report includes a paper by Andrew Ortony and a reaction tc his paper from a practitioner's perspective by Theresa Rogers and Linda Fielding. Ortony's report deals with an important topic--the comprehension of metaphor. The comments by Rogers and Fielding address the ramifications of Ortony's remarks for teaching practices. They clarify some of Ortony's comments as well as examine the instructional implications of his analyses.

Theoretical and Methodological Issues in the Empirical Study of Metaphor

Language is a strange and interesting tool. We use it all the time with great familiarity, yet the mechanisms underlying its operation are almost total strangers to us. Of course, we all know that language is a system of rules and conventions that makes possible the expression of thoughts, aspirations, promises, requests, questions and so on. However, particularly when one comes to the study of metaphor, this does not tell us very much. One reason is that a metaphor, at least at first glance, seems to depend on the violation of rules and conventions for its success and intelligibility. But nonsense also depends on such violations for its failures and unintelligibility. If, therefore, one attempts to treat metaphors (and other tropes) as violations of conventions, one will have to be sufficiently specific about which conventions are violated and in what manner, to distinguish metaphors from nonsense. To do that would be tantamount to providing a definition of metaphor, something that I shall not attempt in this paper (but see, Ortony, 1980; Ortony, Reynolds & Arter, 1978, for discussions of this issue).

Whether or not metaphors are to be accounted for in terms of conventions for violating conventions, there are several reasons why the topic of metaphor is a particularly interesting and challenging one. Which of these reasons one finds most compelling depends a great deal on one's perspective. From the perspective of a scholar of literature an important reason might be that a

better understanding of the mechanisms underlying tropes in general, and metaphors in particular, is likely to lead to a better understanding of the nature and functions of literature itself. This is especially true if one views tropes as an essential ingredient of literature; metaphors, after all, have traditionally been regarded as the archetypal trope. For the teacher of literature (particularly to pre-adolescent children) one might have some quite practical reasons for wanting to understand the nature of figurative language. Children certainly cannot understand all of the metaphors they encounter (indeed many adults cannot either), and from this fact at least two interesting questions arise. First, what are the limits or constraints that exist on the comprehension of metaphors? Are they, as some psychologists (e.g., Asch & Nerlove, 1960; Cometa & Eson, 1978) have suggested, cognitive constraints, or are they merely the constraints imposed by a limited experience of the world? Second, if metaphors fulfill a necessary communicative function by permitting the articulation of literally inexpressible ideas (Ortony, 1975), how is one to explain to someone who fails to understand a metaphor what that metaphor "means"? These questions are also of concern to the developmental and cognitive psychologist interested in the psychological processes underlying the comprehension of language in general. Furthermore, for psychologists, metaphors and other figures of speech seem to constitute an interesting "special case" with which a comprehensive theory of language development and language comprehension ought to be able to cope. Finally, from the perspective of those interested in the teaching of reading comprehension, it would be helpful to know whether, and if so under what

conditions, children's reading materials make unreasonable demands on their cognitive capacities. If one could answer this question, it might be possible to determine whether and when metaphors in texts facilitate or hinder learning.

These and many other questions about metaphors and figurative language need to be answered. Many of them are closely related to the nature of language and communication in general, and to the nature of language acquisition. However, I shall only consider some of these issues, and my discussion will often serve to block off dead ends rather than to cut new paths through the forest. A comprehensive treatment of many of the philosophical, psychological, linguistic, and educational aspects of metaphors can be found in Ortony (1979 - a).

Metaphor and Meaning

If metaphors are to be explained in terms of convention-violating conventions (which certainly is not a foregone conclusion), then at least some of the conventions violated must be meaning conventions. This is because the meanings of expressions used metaphorically somehow depart from their usual meanings. The basic issue is nicely brought into focus in one of those charming exchanges that takes place in Lewis Carroll's Through the looking glass. Humpty Dumpty is talking to Alice:

> "When I use a word," Humpty Dumpty said in rather a scornful tone, "it means just what I choose it to mean - neither more nor less." "The question is," said Alice, "whether you can make words mean so many different things." "The question is," said Humpty Dumpty, "which is to be master, that's all."

In metaphor one might think that Humpty Dumpty's case is made; for in metaphor, an author uses words to mean what they do not usually mean. But Alice has a point too. One cannot, either in metaphorical or in literal uses of language, allow a word to mean just whatever one chooses, unless one does not care about succeeding in communicating. To put the matter another way, one cannot arbitrarily assign an old word to a new meaning. The existing meanings associated with the word impose constraints on how a hearer or reader will construe it. So, whom are we to believe, Humpty Dumpty or Alice? The answer is that there is truth on both sides. The relationship between language users and language is not that of master to servant, but of partners. Each influences the other. On particular occasions one of them may gain the upper hand. If I walk outside into a torrential downpour and remark "It's raining quite heavily," my communicative intention has been achieved with language constraining what I say. If I had chosen to express the same idea, taking advantage of Humpty Dumpty's license, by saying "My sister got married last year," I would have no right to expect anybody to take me to mean that it was raining. But suppose I had remarked "It's a beautiful day." Then, while the language still imposes constraints I have stretched it, and in stretching it, I temporarily became the master. My sarcastic remark ought not to be taken literally, for it was not intended to be, yet its relationship to my intentions was not as arbitrary as Humpty Dumpty would have it. The same is true of metaphors.

Now all of this boils down to recognizing a distinction that has prevailed in the philosophy of language for quite some time, namely, the

distinction between meaning and use. When people use a metaphor, meaning and use become about as remote from one another as is possible in the course of successful communication. When they use metaphors, people do not mean exactly what they say, and they do not say exactly what they mean. If someone says that politics is a rat race, he or she does not mean exactly that, for politicians are not really rats, and what they do is not really to race. Presumably, what is meant has something to do with competitiveness, and perhaps ruthlessness, but that is not exactly stated. By contrast, in so-called literal uses of language, people mean what they say, and they say what they mean.

If we accept this conclusion, the question of how people understand metaphors immediately arises. If what is said is not what is meant, how do we discover what is meant? Do people manipulate the meaning of a metaphorical statement to fit with the emerging picture of the world that the author is presenting? Do they manipulate an emerging picture of a world so as to permit the literal interpretation of the words? Or, do they sometimes do one and sometimes do the other (Levin, 1979)? Whatever the answer, how are such manipulations achieved? The way that one approaches such question depends, at least to some extent, on the position one takes with respect to what metaphors are.

There are three predominant views of metaphor. First, there is the substitution view, a view which maintains that metaphors are essentially linguistic ornaments for which their more prosaic literal equivalents can readily be substituted. According to this view, when John Dean told Richard

Nixon that there was a cancer on the Presidency he merely meant that something was seriously wrong, and he could as easily have said just that. Second is the comparison view which maintains that metaphors are implicit comparisons. Here, the cancer metaphor is seen as being, at least potentially, a little richer, for it implies that there is a similarity between the state of the Presidency and a cancer-ridden patient, and the possibility that some aspects of the similarity are literally difficult or impossible to express is not ruled out. Finally, there is the interaction view which is based on the idea that the terms in a metaphor (the topic and the vehicle) somehow interact to produce some new, emergent, meaning. On this view the juxtaposition of the notions of the Presidency and a cancer result in some new conception that is at once greater and less than the two together. The interaction view was first proposed by Richards (1936) and was subsequently championed by Black (1962, 1979).

These views are not totally incompatible with one another; in fact, many proponents of the substitution view have also been proponents of the comparison view, most notably, perhaps, Aristotle. From the perspective of how metaphors are understood, however, the real contrast seems to be between the comparison view and the interaction view. While the interaction view is rather difficult to shape into a coherent psychological process theory, not least because of its vagueness (but see Black, 1979), there have been attempts to employ the comparison view for this purpose (e.g., Kintsch, 1974; Miller, 1979). Such accounts usually postulate a comprehension process wherein the metaphor is converted into an explicit comparison. It is translated, these

authors suppose, from the metaphorical to the (presumed) literal--from something ornamental to something transparent and prosaic. This conception of nature of metaphors, however, suffers from a number of serious defects (Ortony et al., 1978; Ortony, 1979 - b). One problem is that the translation of a metaphor into an explicit comparison cannot always be realized. For example, how does one translate Macbeth's remarks about sleep into explicit comparisons?

> ..... - the innocent sleep,
> Sleep that knits up the ravell'd sleave of care,
> The death of each day's life, sore labour's bath,
> Balm of hurt minds, great nature's second course,
> Chief nourisher in life's feast, -

(Incidentally, in the next line Lady Macbeth asks "What do you mean"!). The translation of these lines into literal language (comparisons or otherwise) would seem to be not only difficult, but pointless too. The metaphors pick out and emphasize certain aspects of sleep in a manner that cannot be comparably achieved with literal language.

Still, it might be objected, there are many instances of metaphor in which it is possible to effect a translation from a metaphorical statement to a simile. Surely, in such cases we have transformed a statement from one that is literally false (the metaphor) to one that is literally true (the simile). I think that this line of reasoning will not work. Even if such a transformation were normally possible, the desired conclusion, that I think is

implicit in such a proposal, would still not follow. It is precisely this conclusion, that similes are the literal counterparts of metaphors, that I think is wrong--wrong because the explicit comparisons to which the metaphors are allegedly reducible are themselves metaphorical in nature. Just as metaphors assert of things properties that they do not in fact possess, so similes express similarities between things that are not really similar. It cannot be argued that the terms in a simile are (literally) similar by definition because to say that two things are similar, and to say it literally and non-trivially, is to say that there are attributes that are important or salient to both that are shared by both. But, in similes we do not find this match of salient features across the terms of the comparison, rather, what we find are that attributes that are important and salient to one of the terms, are only partially applicable to, or less important attributes of the other (see Ortony, 1979b for a more detailed discussion of this). Thus, when Wordsworth writes "I wandered lonely as a cloud," the solitude that is so essential to an individual's "lonely wandering," is certainly not an essential feature of clouds (particularly in Britain). It is, however, a feature that can sometimes be applied to clouds. Typically clouds are not mavericks, they are too gregarious for that. Of course, all these things are matters of degree, but I think it is important to recognize that one cannot "explain away" the interesting features of metaphors by reducing them to comparisons, because even when such a reduction is possible, the resulting simile raises exactly the same question as does the metaphor from which it came.

The fruitlessness of attempting to reduce figurative language to literal language is perhaps only obvious to scholars of literature who may wonder why anyone should even entertain the idea. Linguists and psychologists, concerned to understand the intricacies of language and its comprehension, get stuck when the rules appear to be broken. The attempt to reduce metaphorical to literal language seems appealing as a way out of the impasse. One conclusion that could be drawn from our observations so far is that while classroom teachers can help children to understand simple metaphors by looking for similarities between topic and vehicle, this strategy is unlikely to be successful for complex literary metaphors. Such metaphors, when they get understood, often get understood in a personal, holistic, and unanalyzable fashion. To peer too closely, searching for a rational understanding, is like moving too close to an impressionist painting. In such paintings a particular brush mark often gets its meaning not from within itself, but from the larger context of surrounding marks. An impressionist picture contains an economy of representation, over, say, a photograph. It conveys a feel, without providing the details. So too with many literary metaphors. It can be just this holistic economy of description that makes it possible to say anything at all. Our understanding of such metaphors has more the character of what Polanyi (1966) called tacit knowledge, than it does of explicit knowledge. That is at once their beauty and their cleverness.

My main purpose in this section has been to discredit the notion that the meaning of a metaphor can normally be explicated in literal language (the substitution view). In particular, I have argued that the reduction of

metaphors to explicit comparisons (similes) cannot explain the metaphorical nature of metaphors because the resulting comparisons are themselves metaphorical. However, this does not mean that the empirical study of metaphors is impossible; it means only that we have to be very careful about how we do it.

Meaning and Comprehension

In order to lay the groundwork for my discussion on research relating to the comprehension of metaphors, I first want to establish a framework in terms of which comprehension in general can be viewed. When people read a text they normally expect it to be meaningful. If they encounter an obscure turn of phrase, or a complex, convoluted sentence, they still seek to understand it because they believe it is there to be understood. So, in some sense, the comprehension of a text presupposes and depends upon the meaning of the text. The account of the relationship between meaning and comprehension that I wish to propose is a very general framework in which the text, the reader, and some other factors interact to produce a resultant interpretation. It is intended to be just as applicable to parts of a text (e.g., metaphors) as it is to entire texts. The system of conventions of the language serves to delimit and constrain ranges of meanings of texts "in themselves." In other words, they serve to prevent authors who hope to be understood from arbitrarily assigning linguistic units to intended meanings. It is in this limited sense, and only in this sense, that I am willing to say that texts themselves have meaning. It is in exactly the same sense that the paragraphs, sentences, and words that may constitute them also have meaning. Thus, the meaning of a text can be

more or less well defined according to the constraining influences of the language it embodies.

To understand a text, the reader has to do something. (It is unfortunately not enough for the printed marks just to float past one's eyes.) Readers are individuals with a (necessarily) personal history. The knowledge accumulated during the course of a reader's life is potentially all available for the comprehension process in which the reader must engage if the text is to be understood. This knowledge has to be conceived of in a very broad manner. It encompasses not merely knowledge of facts, but beliefs, attitudes, prejudices, aspirations, hopes and fears. It is a notion that includes the emotional as well as the intellectual, the probable and possible as well as the certain. Much of a person's knowledge is idiosyncratic, resulting from his own unique experiences. But much of it is also shared by others--others speaking the same language, others sharing the same culture, others with similar interests, and so on (Clark & Marshall, 1981). Thus, some knowledge is unshared and some is shared. An emphasis on the role of background knowledge is now commonplace in accounts of reading comprehension (see, for example, Spiro, Bruce & Brewer, 1980). These accounts generally assume a theory of the organization of knowledge called Schema Theory (Rumelhart & Ortony, 1977) in which concepts are regarded as structured representations of what is known.

Such a broad conception of knowledge, together with the shared/unshared distinction is essential for several reasons. First, people communicating with one another must of necessity have some shared knowledge (for otherwise their

communication could never get off the ground) and, in general, there must be some unshared knowledge (for otherwise there would be nothing nothing new to say). Second, the shared knowledge can be of different kinds, thus permitting different genres of text to achieve different communicative goals. This is obvious if one considers texts with respect to different audiences. The art historian is not expected to share the requisite knowledge with the author of a technical article in a medical journal, but has as good a chance as most other people of understanding a detective story. Even here, however, notice that knowledge about the structure of such stories may give rise to a different (deeper?) understanding than would be normally achieved without that knowledge. Finally, different texts and text genres make differential demands on the shared/unshared knowledge ratio. For example, it is presumably a purpose of a legal document to be unambiguous. Its author wants to minimize its dependence on unshared knowledge. So too with recipes and instructions. By contrast, many works of literature and much poetry invite "interpretation."

We have, then, these two principal components: texts with their meaning, and readers with their knowledge. The result of the interaction of the two is an interpretation. Texts have meaning in the sense that they impose constraints on probable, perhaps even on possible, interpretations. Readers draw upon their knowledge in order to generate an understanding, or interpretation of a text. There is one other important factor that has to be included. I shall refer to it as ambiance. By ambiance I mean the total situation in which a text is read. It includes linguistic context in the usual sense, but it also includes many more general aspects of the situation

including such things as the reader's purpose for reading the text, and the reader's mood while reading it. Ambiance affects the interpretation that a reader makes of a text by selecting or suppressing knowledge that could be used in the comprehension process. Consider, as an example, the different interpretations that an imaginary reader might impose on a novel like Crime and Punishment. Suppose, in the first case, our reader was planning a murder just to see what would happen and how he would feel. In the second case let us suppose that he has just committed such a crime, while in the third case we will suppose that he had done so a year earlier and was beginning to feel that he would get away with it. It seems reasonable to suppose that in each case different aspects of the novel would take on more importance in the reader's interpretation. In the first case perhaps the novel would be read as a "blueprint." In the second, the descriptions of anxiety and nervous excitement might be highlighted, and in the third it might be interpreted as a vindication (or partially so). Of course, in these three hypothetical situations the knowledge we suppose the reader to possess is different, but so too are those things which are prominent. These changes in prominence are the results of the filtering effects of ambiance. That the perspective a reader takes has dramatic effects on what he or she attends to and considers important in a text has been convincingly demonstrated in an experiment by Pichert and Anderson (1977).

The general conception of the relationship between a text and its meaning, and a reader and his or her interpretation is as applicable to parts of texts as to complete texts. So, returning to metaphors, one can view their

comprehension as involving many of the same fundamental processes that are involved in the comprehension of any other piece of language. The comprehension of metaphors, and of the texts in which they occur, very often manifests itself in the reader's recognition that he or she has achieved some kind of insight into the author's meaning or intention. I have been arguing that metaphors (especially good ones) frequently resist translation into literal language. I have taken the position that metaphors are a principal means of expressing the literally inexpressible. Now one of the features of language in general is that one can use it to say "old" things or "new" things. Sometimes one remarks on things that are obvious, or that have been forgotten by one's addressee, and that one knows are not going to come as a revelation. But, on other occasions, one uses language to convey new information. In these cases, the speaker or writer knows, or believes, that the hearer or reader does not know what the speaker knows. In the realm of literal uses of language this distinction goes more or less unnoticed. In the realm of figurative uses of language the distinction can be very important, for there one has the opportunity to say something radically new that cannot be said literally.

It seems to me that one of the ingredients of creativity is the ability to break away from the traditional ways of seeing things into new ways of seeing things. It is probably the case that our language has developed in just such a way as to permit the expression of things within the framework of a particular perspective, or way of seeing the world, so that if we do come to see the world, or some aspect of it, in a totally new way, our language will

be poorly equipped to express the novelty. Poetry is an example par excellence of text that permits readers to see things in new ways. In some cases a deep understanding of it can result in the comprehender discovering something new, rather than recognizing something already known. Thus an author's insight can lead to the same, or a related, insight in the reader. The creative component of literature (as well as of the other arts) need not, therefore, be merely stylistic. It can often be cognitive too. All of this, however, is speculative. The investigation of the relationship between insight and the comprehension of (non-trivial) metaphors is an interesting, if difficult and largely unexplored research area. There are less difficult problems that one can address, and it is to these that I now turn.

Investigating Metaphors Empirically

So far I have suggested that meaning should be conceived of as conventionally imposed constraints on possible or probable interpretations of texts, or parts of them. The real work of comprehension arises as a result of the filtering effects of ambiance determining which aspects of a reader's knowledge will be brought to bear in generating an interpretation. Once we accept this framework, it becomes obvious that empirical investigations into the nature of metaphors, and into any special psychological processes that might underlie their comprehension, is better conducted when the metaphors being studied occur in appropriate contexts. Yet, attractive though it might be to confine one's discussions of and research into the nature and functions of metaphor to genuine novel metaphors found in works of literature, such a goal is impractical for a variety of reasons. One reason is that it is much

easier to develop a theory in such a complex domain if one starts by focusing on simple clear cases. One can then go on to see if it can be extended to more complex cases. If one tries to start with complex cases, there tend to be too many unrecognized factors at play, and theory construction becomes much more difficult. In the case of metaphors, it can be very difficult to find "pure" cases, that is, cases that are not contaminated with other tropes such as oxymoron ("a living death"), synesthesia ("a dazzling sound"), metonymy ("The White House refused comment"), and synecdoche ("let's take a head count"). A simple example of this from the Macbeth quotation is the case of synesthesia in "hurt minds." Now, it is of course true that there is a close relationship between metaphors and the various other tropes, but their different characteristics make it possible that the comprehension process required to understand them might be different, if only subtly so. A good modus operandi, therefore, is to ensure that initial research in the area considers simple and clear cases. Of course, a corollary of this is that it may sometimes be necessary to construct "artificial" materials so that the characteristics of the materials are known, rather than using naturalistic materials where it is much less likely that they will be.

An example of this kind of approach is provided by a number of studies recently conducted in our laboratory. Some of these studies (e.g., Reynolds & Ortony, 1980; Vosniadou, Ortony, & Reynolds, 1982) were designed to investigate whether young children would be able to understand metaphors, and if not why not. There is a history of psychological research which suggests that children cannot really master metaphorical language until they reach 10

or 11 years of age (e.g., Asch & Nerlove, 1960; Cometa & Eson, 1978; Winner, Rosenstiel & Gardner, 1976). If this were true, one might need to review very seriously what children below these ages are expected to read. However, much of the research suffers from conceptual and methodological problems that render it suspect (see, Ortony et al., 1978, for a review).

Theoretically, there could be at least three reasons why young children cannot understand metaphors, if they cannot. First, there may be special cognitive processes required to relate the disparate domains that are involved. Second, a child might have the requisite processes, but he or she might lack the knowledge of the domains that is required to recognize the relationships between them. Third, a child might have both the processes required, and the knowledge required, but might lack the metalinguistic skill needed. This would mean that the child would not know that there was a convention that permitted one to say what one did not really mean.

In an experiment designed to examine some of these issues (Reynolds & Ortony, 1980), children were given a number of specially constructed short stories, each about 150 words long. The stories were accompanied by pictures. After the child had read through one of the stories with the experimenter, he or she was shown four sentences and asked to select the one that best "fitted" the story just read. The sentences were constructed with the following characteristics: either, (a) one of the four fitted the story if interpreted literally, and none of the other three made sense under any interpretation. If a child saw a set of sentences with these characteristics he was said to be in the "literal" condition. Or, (b) the sentences were such that none of them

fitted if given a literal interpretation, but one of them could be interpreted metaphorically--the "metaphor" condition. Or, (c) the sentences were all transformed from those in the metaphor condition into sentences in a "simile" condition, wherein the same sentences were modified to include the word "like" to mark an explicit comparison. Children in the experiment received four items in the literal condition, followed either by four in the metaphor condition, or four in the simile condition. So, each child saw eight stories in all. For each story, if the child were merely guessing, he or she would be right 25% of the time, since there were four alternatives from which to select a response. One of the stories was about an unfortunate racehorse called Jack Flash:

The Old Racehorse

> Jack Flash had been a great racehorse when he was young. But now he was too old to race. His owner thought Jack Flash wasn't good for anything any more. None of the other people who worked at the ranch where Jack lived paid any attention to him. No one wanted to ride an old broken-down horse. The owner decided that he did not want Jack around where people could see him.

Children in the literal condition had to select the most appropriate continuation sentence from:

A. Jack was sent to one of the pastures in the back of the farm.
B. The owner of the ranch played with Jack every day.
C. Jack was given the best stall in the ranch to stay in.

D. Jack hated eating oats for breakfast.

Children in the metaphorical condition saw:

A. The saddle was polished and shiny.
B. The worn out shoe was thrown into the trash.
C. The race was going to begin.
D. The raincoat was new.

Those in the simile condition had to choose from among:

A. It was like a saddle that was polished and shiny.
B. It was like a worn out shoe that was thrown into the trash.
C. It was like a race that was going to begin.
D. It was like a raincoat that was new.

In this example, a response would have been scored correct if it was A in the literal condition and B in the other two conditions.

The results showed that in the literal condition the children (at grade levels 2 through 5) were virtually perfect. In the simile condition they were performing at about the 50% level, and in the metaphor condition performance improved from about 20% (approximately at chance level) for second graders to about 50% for fifth graders. The fact that the children were able to perform almost perfectly in the literal condition tells us that they understood both the story and the task. The fact that they performed significantly better than chance on the similes shows that for the most part they had the cognitive processes required to relate the two domains, and that at least in some of the cases they had enough appropriate knowledge of the world to enable them to do so. That leaves only the meta-linguistic hypothesis open to explain their much poorer performance in the metaphor condition. It suggests that the reason that they could not select the sentence that fitted in the metaphor condition was that they could neither see a literal interpretation that made sense, nor,

more important, could they construe what they saw as making any sense at all. It either did not occur to them, or they were unable to conceive of the possibility that language can be used to say what is not meant. In other words, with reference to the general framework of comprehension outlined in the last section, the problem appears to lie not with the "meaning" of the metaphors, but with the knowledge filtering effects of ambiance. It is as though the children were operating with an insufficiently liberal mechanism for imposing an interpretation on a text.

In another series of studies (Vosniadou et. al., 1982), we explored the abilities of (especially) 4-year-old and 6-year-old children using a rather different experimental paradigm. In it, children were asked to act out the events described in stories in a toy "world" comprised of models of familiar buildings (a school, a church, a MacDonald's restaurant, houses etc.). Even the 4-year-olds were able to understand the metaphors in the context of the stories. From the three experiments, it seems that different variables cumulatively contributed to the overall difficulty of comprehending the metaphors in the context of the stories in which they appeared. These variables were: (a) the extent to which the event described metaphorically was predictable on the basis of the context alone, (b) the complexity of the metaphor itself, and (c) the explicitness of the metaphor (i.e., whether it was presented as a metaphor or as a simile). The complexity of the metaphor was manipulated by varying the number of words that required a metaphorical interpretation in the concluding metaphorical sentence. In particular, in the less complex condition, the metaphors included two nouns that required a

metaphorical interpretation (e.g., "Sally was a bird going to her nest") while in the more complex condition, the verb also required a metaphorical interpretation (e.g., "Sally was a bird flying to her nest"). Finally, as in the Reynolds and Ortony study, the explicitness of the metaphor was manipulated by using either the metaphor form (implicit) or the simile form (explicit).

The data showed that children produced significantly more appropriate enactments of the metaphors when these metaphors described predictable rather than (relatively) unpredictable events. However, they also showed that the predictable events were much more likely to be enacted given the preceding context and the metaphor than they were given the context alone. We know this because when the children were asked to show us how they thought the story would end, given only the initial context, they were much less likely to produce the "correct" enactment than when they were given the outcome in a metaphor. The data also showed that for both age groups, performance with more complex metaphors was poorer than with less complex metaphors, and that performance with metaphors was poorer than performance with similes. However, 4-year-old children were performing at about the 75% correct level with the easiest combination of the variables. This compared to a 50% probability of the children providing the same correct enactment when given only the context and asked to produce the most likely ending.

The findings from such experiments lead to an interesting speculation about how one might be able to train children who apparently are unable to understand metaphors, to come to understand them. Suppose that one finds a

child who can understand metaphors in their simile form, but not in their metaphor form. One might first have the child do the task successfully in one of the simile conditions in the experiments described above. Then one might present the child with a set of items in their metaphor form. Between the two sets of items one might say something like "These are really exactly the same, but they don't have the word 'like' in them." Now we might expect that insofar as they can do the similes, they will be able to do the corresponding metaphors.

Notice that in the experiments I have described we used metaphors that have corresponding similes. As I argued earlier, this does not commit us to the view either that all metaphors have corresponding similes, or to the view that similes are literal. It merely enables us to look at comprehension differences in cases where there are corresponding similes. Indeed, it is precisely because young children can understand similes (at least significantly better than chance would predict) that I wish to argue that they possess the essential skills required to understand metaphorical language, provided that they recognize that it is metaphorical.

It seems to me that this is an example of an approach to research that carries with it some interesting possibilities for the teaching of this aspect of language use, even with very young children. But notice this: it is not very easy to find naturally occurring cases of metaphors which can be easily transformed into corresponding similes. In fact, it is difficult enough to find metaphors in first and second grade texts that are amenable to any kind of experimental manipulation. So if one is interested in investigating the

ability of young children to understand metaphors, and if one is interested in investigating their sensitivity to them, it is almost essential to use the kind of artificial materials that we did. An alternative that researchers have tried, is to elicit from children reports about how they understood metaphors (Billow, 1975; Malgady, 1977; Cometa & Eson, 1978; Winner et al., 1976). However, research shows that the ability of young children to understand and articulate their own cognitive processes and products, lags far behind the development of these processes and products themselves (see for example, Brainerd, 1973; Brown, 1978). Consequently, this approach can be very misleading.

Another piece of research (Ortony, Schallert, Reynolds & Antos, 1978), conducted with adults highlights a second serious difficulty associated with investigating people's responses to metaphors. Since one cannot measure various kinds of responses in absolute terms, it becomes necessary to compare responses to metaphors with responses to something else. But, what else can one compare them to? If we have to be wary of the notion of a literal translation of a metaphor on the grounds that it may be cognitively, phenomenologically, and informationally different, the most obvious yardstick seems to be problematic. In the experiment I shall describe, we compared comprehension of a sentence used metaphorically to the comprehension of that same sentence in a context in which it was interpreted literally.

The main question that we addressed in this experiment was whether or not metaphors are necessarily more difficult to understand than literal sentences. To address this question, we constructed a number of vignettes in which a

short passage (about 50 words in length) was defined as the context. Then, for each context, we constructed a perfectly ordinary literal sentence to follow. This sentence we called the target sentence. Each target was matched with two contexts, one that induced a metaphorical interpretation of it, and one that induced a literal interpretation of it. So for example, one of the targets was: The castle was crumbling at its very foundations. Any particular subject would see it preceded by one of two contexts, a literal inducing context (1), or a metaphorical inducing context (2).

> (1) The old fortress on the Rhine needed major repairs because an underground stream was slowly eroding its base. Unfortunately the government was reluctant to appropriate the money needed to maintain it. One needed only to visit the dungeons to see gigantic cracks in the walls and to become convinced that unless repairs were begun, the fortress would soon be lost.
>
> (2) The established theory was being seriously questioned because of emerging critical findings. Although it had been accepted for many years, the theory was now incapable of explaining some newly discovered phenomena. Its deficiencies were deemed so serious that there seemed to be no way to save it. Even the most basic assumptions of the theory were being challenged.

For every item, subjects were presented with the context and when they had read and understood it, they pressed a button. The target sentence was

immediately displayed on the computer-controlled screen and subjects were instructed to again press the button as soon as they had understood the displayed sentence. The time required to understand the target sentence was measured. Results showed that there was no significant difference in the time that subjects took, regardless of whether the sentences required a literal or a metaphorical interpretation. Our explanation of this finding was that if the idea being expressed by the target sentence is sufficiently compatible with the context then it really does not matter whether that idea is expressed literally or metaphorically. In other words, what determines the ease of comprehension is not so much the manner in which the ideas are expressed, but the degree to which they are thematically related to what has preceded them. This was to some extent confirmed by the data from another condition in the experiment. In some cases, subjects were presented not with the entire context, but only with the first phrase or sentence from it (e.g., The old fortress on the Rhine needed major repairs, or The established theory was being seriously questioned). In this "short context" condition, subjects took much longer to understand the target sentences, whether literal or metaphorical, than in the long context condition, but this was especially true for the targets requiring a metaphorical interpretation. This interaction of the thematic relatedness of the target to the context, with the kind of target (literal or metaphorical), suggested to us that metaphors do contribute some difficulty of their own, but that this difficulty is negligible if the text as a whole (context plus metaphor) is coherent and well organized.

Notice that in this experiment we were able to make a meaningful and valid comparison between a metaphor and a literal statement. Although I have argued that in general this cannot always be achieved, we selected metaphors for which this was not a problem. These metaphors I call "whole sentence" metaphors. They have the characteristic that they are not internally anomalous or semantically deviant. By contrast, a "part sentence" metaphor is one in which individual words or expressions within a sentence are anomalous with respect to that sentence, quite regardless of the larger context in which it occurs. Part sentence metaphors are often impossible to paraphrase, except by using other metaphors (e.g., the ship plowed the seas).

If there is a generalization to make about methodology here, it is that one's conception of what a metaphor is inevitably influences the kind of research that one can do. In rejecting standard definitions of metaphor in favor of one that permits a normal sentence to sometimes require a metaphorical interpretation and sometimes a literal one, we can investigate all kinds of questions that would otherwise have been difficult or impossible to study rigorously. This approach has the added advantage of forcing us to examine metaphors in a reasonable (if not totally naturalistic) context, and this is essential if one holds a view of the comprehension process of the kind I have outlined above.

Even from the few studies that I have described, I think one can draw some interesting conclusions about the comprehension of metaphors. For example, although metaphors do seem to constitute an intrinsic source of comprehension difficulty, it appears that this difficulty is normally

overshadowed by sources of difficulty having no particular connection to metaphors at all. For example, our studies suggest that the thematic relatedness of the idea expressed to the preceding context makes a big difference to the ease with which a metaphor can be understood both by adults and by children. However, this is a quite general factor in language comprehension. There are no doubt countless examples of thematically related metaphors being easier to understand than (relatively) less related literal language. When we come to consider what unique source of difficulty to comprehension metaphors might provide, the only answer one can seriously contemplate suggests that even this may be a general language processing variable. Thus, my hunch is that the problem of understanding metaphors is, in most cases, a problem of determining the referents of the terms that are used metaphorically. In the case of the Ortony et al. (1978) study, for example, subjects had to make sense of the statement

The castle was crumbling at its very foundations in the context of a collapsing scientific theory. The sentence employs the definite article which ordinarily indicates that the referent has already been mentioned, yet there was no mention of a castle. What can the reader do? Presumably the reader does exactly the same as he or she would do if instead of The castle the sentence had started with the word It. The reader tries to determine the referent, and the context really does not provide very many candidates. When we read on and discover that the castle was crumbling we know that whatever the referent of The castle is, it must be something that is being threatened. In other words, the metaphor carries with it a set of implications which, in a

general way, can be matched with a set of facts already stated, or inferences deducible from those facts. Notice, however, that the process of determining the referents of referring expressions is a perfectly normal aspect of literal language comprehension. In this particular case the main difference seems to lie in the fact that the referent cannot be what it would normally (literally) be. This could be momentarily misleading, but if the reader assumes that what is written is written in good faith, it is indeed only momentarily so. Once the reader has identified the castle with the theory, the rest of the sentence is smooth sailing.

My arguments so far have suggested that the comprehension of metaphorical uses of language probably does not require any special cognitive machinery over and above that required to understand literal uses of language. If this is correct, then one would expect young children to be able to understand metaphors to the extent that they already have the ability to understand literal language. Our developmental data are in line with this prediction. They show that if one does not introduce too many sources of difficulty even 4-year-olds can understand metaphors in context. This finding may be at odds with the received wisdom about children's ability to understand metaphors, especially when that wisdom is based on a Piagetian approach to cognitive development. But if the facts show that the received wisdom is incorrect, it seems better to revise the received wisdom than to ignore the facts. The area of metaphor comprehension is by no means the only one in which recent research has demonstrated cognitive abilities in children at much younger ages than predicted by Piagetian theory (Gelman, 1978; Chi,1978; Markman & Siebert, 1976).

Conclusion

To conclude, I want to summarize the main points, and then outline some future directions that I think research in the area might take. I have argued against the notion that metaphors are routinely translatable into literal language. I have argued that even their reduction to similes, in cases where it is possible, solves only methodological problems. It does not, however, explain the mystery of metaphor. For these reasons, among others, I have emphasized the advisability of using artificially constructed metaphors in artificially constructed contexts as materials for use in initial research efforts. The use of such materials permits one to exercise some control over the variables at work, as well as reducing the constraining influences of untranslatability. I should emphasize again, that whether something is a metaphor, a literal statement, or nonsense, depends on the context in which it occurs, so metaphors should always be investigated within some reasonable linguistic context. What else should be done? What else could be done? Naturally, there are far more unanswered questions than answered ones; I shall only pose a few of them.

First, there are two issues raised by Levin (1979). One of these has to do with the question of construal that I mentioned earlier. Can one distinguish between metaphors that are comprehended by modifying meanings, from those that are comprehended by modifying the model of the world that the reader constructs on the basis of his or her understanding of the text? If this emerging model is manipulated by the reader so as to be consistent with the metaphor, is it really a metaphor at all? Perhaps it is merely a highly

context-sensitive literal statement. The other issue raised by Levin has to do with what controls the way in which metaphorical meanings are construed. Here one might investigate the comprehension of ambiguous metaphors, that is metaphors in which there are two candidate terms for metaphorical interpretation such that if one is given a metaphorical interpretation the other must be given a literal one, if the sentence is to remain coherent. For example, either flowers or smiled, but not both, must be interpreted metaphorically in The flowers smiled at him in the park. In cases where the context does not make it clear, is there any evidence that people show patterns of interpretive preference (e.g., treating the noun metaphorically rather than the verb). If such patterns do appear, what explanations can be given for them?

Second, is it true that part of the power of metaphors lies in their vividness and the ease with which images of them can be constructed, as I have suggested elsewhere (Ortony, 1975)? If so, they should be very memorable, provided that they are understood. I believe that these are features of fundamental importance, but there is still very little concrete evidence. In fact the whole area of the relationship between metaphors and imagery is very murky. Presumably if a reader were to spontaneously construct an image of the metaphorical vehicle, that image would be full of details that could not possibly facilitate the comprehension of the metaphor. So, if one were to read that skyscrapers are the giraffes of cities, it is not at all clear how one could take advantage of the fact that it is easy to construct a mental image of a giraffe. There currently exists no coherent theory of the role of imagery in the comprehension of metaphors.

Third, what role does metaphor play in the creative use of language by children? How can we distinguish metaphors from mistakes and misconceptions in the early stages of language development as when, for example, a child uses his word for moon to refer to cakes (Chamberlain & Chamberlain, 1904)? Do metaphors figure in the writing of children before, after, or at about the same time that they come to comprehend the metaphors that they encounter in the texts that they read?

Fourth, what are the constraints governing children's use of metaphors? I have outlined one way of addressing the issue; there are surely others. It would be very useful to discover the nature and frequency of metaphors as they occur in different kinds of texts for children of different ages. Judy Arter and I once scanned fifth and sixth grade social studies texts, looking for metaphors. We were amazed at the sophistication of some of those that we found. Is it in fact the case that excessively high expectations on children's comprehension are being unwittingly placed upon them by authors? How do children's stories compare with expository texts in this respect? And, how do these compare with poetry through the grades? Finally, it would be interesting to know how the results of such an investigation relate to the popularity and comprehensibility of the texts.

There are many other difficult issues to be studied, some very theoretical, some very practical. An example of a more theoretical question concerns the relationship between metaphors and similarity. During the last few years we have been developing a theory of similarity that includes metaphoricity as a component (Ortony, 1979 - b). Whether such a theory can

have sufficient explanatory power to elucidate the nature of metaphors that are not obviously based on similarity statements is still not clear. Another interesting issue relates to the three views of metaphor discussed earlier. It is quite possible that what these views actually reflect are not alternative theoretical treatments of one phenomenon but rather complementary accounts of three phenomena. In other words, it might be that some metaphors are substitution metaphors, while others are comparison metaphors, and yet others are interaction metaphors. If this should turn out to be so, it might provide the basis of a very helpful taxonomy of metaphors.

Finally, as an example of a more practical issue, one might enquire as to whether what we already know, or what we might discover, ought to suggest a reanalysis of certain classroom and instructional practices. Ought it to suggest a reanalysis of the teaching of reading and of literature, what to teach, when to teach it, and how to teach it? Certainly, when one reviews those sections of basal readers concerned with figurative language what one finds is very misleading. Of course one cannot wait to teach until the theoreticians can provide a solid theoretical basis for doing so, but we know enough already to be able to say with some confidence that much of what is taught about figurative language to children in the early grades is based on theoretical quicksand.

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Footnote

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Implications and Suggestions for Teachers

The studies reviewed here support approaches teachers can or already do take to help children understand figurative language. Although the author indicates that no one can say exactly what metaphors are or how it is that they do their work, he suggests looking at metaphors as expressions wherein the meanings of words somehow "depart" from their original meanings or uses. However this departure works, it is by no means random or arbitrary. What may happen is that the intensional meaning of the metaphor's vehicle is restricted in order to enable the extension of this meaning to the topic. For example, in the metaphor The stars are diamonds in the sky, the meaning of diamonds (the vehicle) may be restricted in just such a way that it can be made to apply to stars (the topic) as well. Such features of diamonds as "allotrope of carbon," "gemstone" and "hard" would be dropped, while features like "twinkling" and "shiny" would be retained. The new restricted meaning of diamonds could then refer to a broader class of items, including stars, whereas the original meaning could not. The ground, or qualities shared by the topic and vehicle of the metaphor, could then be seen as a product of this restriction and extension.

Ortony's paper takes an analytic look at metaphors, concentrating on the parts of metaphors, how metaphors get understood, problems children may have in the comprehension of metaphors, and how teachers can help. A language arts teacher's first response may be, "Metaphors should be celebrated, not analyzed!" Ortony, though not concentrating on them here, does recognize the aesthetic and facilitative possibilities of metaphors.

He suggests elsewhere that metaphors may enable writers to say things that can't be said in literal language, and that they may increase learning both through their vividness and imageability and through the deeper processing that is required to understand them. (The reader is referred to Ortony, 1975, 1980, for discussion of these topics.)

Given, however, the analytic approach which is taken in this paper, what does it imply for teachers of the language arts? What are the demands made of students who are expected to comprehend metaphorical language, and how can those demands be alleviated? In response to Piagetian developmentalists, who suggested that metaphoric comprehension proceeds in developmental stages (e.g., Billow, 1975; Winner, Rosenstiel & Gardner, 1976), researchers using improved experimental designs have shown that it is not the inability to deal with metaphorical language per se but various factors in the context, in the text, and in the reader that contribute to ease or difficulty of comprehension. First, it was discovered that problems arise when a metaphor is not predictable or probable on the basis of the context. Second, a metaphor itself is more difficult if it is complex (e.g., if there is more than one nonliteral term) or if it is inexplicit (similes are slightly easier for children to understand because the connection is made explicit--something is said to be _like_ something else). Third, if children do not have the background knowledge necessary to relate disparate domains (such as the physical and the pyschological), this will interfere with their processing of the metaphor. For instance, many children may not know that a rock, normally considered part of the physical domain, can function as a descriptor of a type of person, as in the metaphor, _The prison guard_

was a hard rock that could not be moved. Finally, in the case of inexplicit metaphorical language, children will have difficulty if they don't have the metalinguistic skills or knowledge to know that people sometimes say what they don't entirely or literally mean.

Given what we know about metaphors and possible difficulties children have in understanding metaphorical language, certain instructional strategies suggest themselves and others seem pointless. Ortony cautions that, although it may help with simple metaphors, bringing children to see similarities between the topic and vehicle of complex literary metaphors is unlikely to help much because, when such metaphors do get understood, it is usually not in a piecemeal fashion, but holistically. He also suggests that asking children to explain the meaning of metaphors places unrealistic metalinguistic demands on them. We as adults probably can't put into words the meanings of many metaphors that we understand perfectly well, so perhaps we shouldn't expect children to do this, either.

Does this mean that teachers can do nothing but sit back and hope that metaphoric understanding will somehow develop in their students? We don't think so. It seems that what is instructionally sound in other areas of comprehension teaching should be equally sound in helping children to understand metaphors. As in all teaching, choosing examples is an important consideration. Ortony explains the rationale for using artifically-constructed metaphors in research studies with children, but we feel that it is equally important in actual instruction for teachers to use good, clear, simple examples selected from what children are already reading.

Considering children's difficulties that have been noted in this paper, teachers should also make sure that the examples have rich contexts, and that the metaphors relate to the context in reasonable ways.

Ortony points out that children may have trouble understanding that people can compare things that are not exactly alike. To get this idea across to children, we suggest starting with what children already know--that we often compare things that are literally alike in many ways; and contrasting this with the new concept--that we can also compare things that are not literally alike. Starting with literal comparisons that children understand, such as A lime is like a lemon or A mouse is like a rat, teachers can contrast these comparisons with metaphorical ones, such as His cheeks were like roses, his nose like a cherry. Such examples, in which the similarities and differences (between cheeks and roses, or noses and cherries) are at least partly verbalizable, may provide teachers with the opportunity to get children ready to understand the kinds of metaphors Ortony mentions, in which the nonliteral similarities perhaps can't be verbalized but can still have meaning.

What should teachers do when children have trouble with the metaphors they encounter in their reading? Ortony suggests illustrating, with appropriate examples, that metaphors are the same as similes without the word like in them. Of course, a one-time illustration would probably have little transfer value for most children. Instead, when troublesome metaphors occur, changing them into similes for the children may help. If it doesn't, teachers can look for other possible sources of confusion. Perhaps students don't have the necessary background knowledge to understand the terms of

the metaphor. In some cases, providing more background knowledge may then enable them to infer a relationship between the disparate domains of the metaphor.

It is not recommended, based on Ortony's considerable research on and knowledge of metaphors, that students be given examples of figurative language out of context and asked to explain "what it really means"--a fairly widespread basal exercise. Ample examples of metaphorical language exist in natural contexts. Providing children with vast exposure to this wealth of metaphor in children's literature by reading to them may be the most important thing teachers can do to get children ready to understand metaphors and to develop children's appreciation of their aesthetic qualities. It seems that it is always preferable to start with the literature children already know and then to provide enough experiences with it so children can develop the skills required for comprehension of the metaphors in it.

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